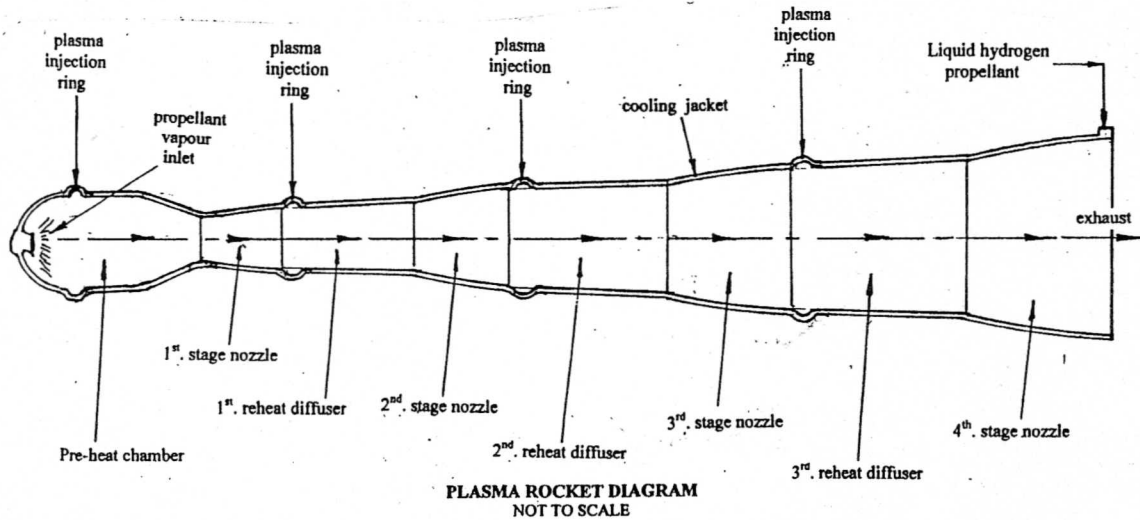


THE PLASMA ROCKET FOR SPACECRAFT

Designed by J Varney June 14th. 2010



Blacklight Power claim that the hydrino plasma has 200 times the heat of hydrogen combustion and is adopted here and is therefore equal to approx. ten million BTU/LB of hydrino plasma.

The plasma rocket system is a means of applying heat energy to the hydrogen propellant [without using the process of combustion], prior to its expansion in a nozzle to develop high velocity and therefore thrust. A relatively small amount of high temperature plasma, injected directly into the propellant stream, is the process employed to achieve this end.

In order to achieve extremely high final exhaust velocity and thus high thrust, it is necessary to heat, expand and then reheat the gaseous propellant in a sequence of four heating chambers [one preheat and three reheat diffusers] and four expansion nozzles [utilizing an initial high pressure condition of the propellant] The liquid propellant, at cryogenic temperature and at a pressure of about 3000 p.s.i., is conveyed through the cooling jackets of the chambers and nozzles before starting its **straight line** journey through those components as a gas, undergoing a cascading pressure and temperature condition in the nozzles and a reheating process in the plasma injected heating chambers. As the plasma [at over two million deg. R], imparts its heat to the propellant stream instantaneously, extreme velocities are achievable and a final exhaust velocity of about 1.27 million ft/sec. is possible.

Operating envelope – Deep space or above 100,000 ft in our atmosphere.

A practical size range for the plasma rocket is as follows:

Smallest unit - Thrust = 100,000 lbs.f. Final mass flow = 2.53 lbs/sec. Final nozzle O.D.= 29.5 inches.

Medium unit – Thrust = 500,000 lbs.f. Final mass flow = 12.66 lbs/sec. Final nozzle O.D = 66 inches.

Largest unit -Thrust = 1,000,000 lbs.f. Final mass flow = 25.31 lbs/sec. Final nozzle O.D = 93.3 inches.

The Specific Impulse for this particular design of unit is 39,428 secs.

Rocket engine stages	Static Pressure p.s.i.a.	Static Temperature deg. R	Local mach #	Actual velocity ft./sec.
Pre-heat chamber exit	1434.4	6000	1	13,866
1 st . stage nozzle exit	143.44	3539	2.3263	24,963
1 st . reheat diffuser exit	140.57	6000	2.3263	32,256
2 nd . stage nozzle exit	14.057	3539	5.4116	58,071
2 nd . reheat diffuser exit	13.780	6000	5.4116	75,037
3 rd . stage nozzle exit	1.378	3539	12.589	135,090
3 rd . reheat diffuser exit	1.350	100,000	12.589	707,816
4 th . stage nozzle exit	0.135	60430	29.047	1,269,595